Self-Reported Exposure to Tobacco Warning Labels Among U.S. Middle and High School Students

Sarah E. Johnson, PhD, Charles C. Wu, MPH, Blair N. Coleman, MPH, Conrad J. Choiniere, PhD

Background: Warning labels on tobacco products are a means to communicate information about the negative health effects of tobacco use to current and potential users. Most tobacco use begins in early adolescence, making it particularly important to understand the degree to which warning labels reach adolescents.

Purpose: To examine the extent to which youth report (1) seeing the current warnings on cigarettes and smokeless tobacco (SLT) products in the U.S. and (2) that seeing warnings makes them think about the health risks associated with tobacco use.

Methods: Exposure to warning labels on cigarettes and SLT, as well as the degree to which adolescents report thinking about health risks in response to warnings, was examined among U.S. middle and high school students using data from the 2012 National Youth Tobacco Survey (NYTS) and analyzed in 2013.

Results: Current data suggest that less than half of adolescents who saw a cigarette pack (46.9%) or SLT product (40.3%) reported seeing the warning label "most of the time" or "always." Among adolescents who reported seeing a warning, less than one third reported that cigarette (30.4%) or SLT (25.2%) warning labels made them think about health risks "a lot." These rates were even lower among current tobacco users ($<14\%$).

Conclusions: Current warning labels for cigarettes and SLT could be improved by implementing warnings that incorporate features that make them salient and more likely to evoke thoughts about health risks.

(Am J Prev Med 2014;47(2S1):S69–S75) Published by Elsevier Inc. on behalf of American Journal of Preventive Medicine

Introduction

Rates of smoking among U.S. adults and adolescents continue to decline. Still, 14% of high school students report current cigarette smoking and 6.4% report current use of smokeless tobacco.[1] Preventing initiation and encouraging cessation through consumer education about the health risks of tobacco use has been one of the primary strategies of tobacco control efforts. Warning labels on tobacco products are considered to be one of the most efficient means for educating tobacco users—and potential users—about the health risks associated with tobacco use.[2–4] Most tobacco use begins in early adolescence, with nearly all (88%) of first use of cigarettes occurring by age 18 years.[5,6] Therefore, it is of particular importance to understand the degree to which warning labels reach adolescents.

The U.S. was the first country to require warnings on cigarette packs, with the first warnings appearing in 1966. Whereas a growing list of nations have adopted larger and graphic warnings,[7] the warnings on cigarette packs and smokeless tobacco (SLT) products in the U.S. remain text-only. However, the size of SLT warnings was increased in 2010 per the 2009 Family Smoking Prevention and Tobacco Control Act. The warnings on cigarette packs in the U.S. today, which appear in a text box on the side of the pack, have not changed since 1985.

From the Office of Science, Center for Tobacco Products (Johnson, Coleman, Choiniere), Food and Drug Administration, Rockville; and the Office of Extramural Research (Wu), NIH, Bethesda, Maryland

Address correspondence to: Sarah E. Johnson, PhD, Food and Drug Administration, Center for Tobacco Products, Office of Science, 9200 Corporate Blvd, Rockville MD 20850. E-mail: sarah.johnson@fda.hhs.gov.

0749-3797/$36.00
http://dx.doi.org/10.1016/j.amepre.2014.05.005

Consequently, the current U.S. warnings are considered among the least effective compared to those now used in other nations.[8]

In order to be effective, warnings must first be noticed.[9] Indeed, recent research suggests that features that make warnings more noticeable or salient, such as graphic images, are associated with greater recall and greater perceived effectiveness.[2] Moreover, warnings that are not only salient but also elicit strong subjective responses (e.g., emotional responses and thoughts about health risks) are associated with greater impact on behavior or related outcomes, including quit intentions and attempts.[2–4,10]

Although much of the extant research on tobacco product warnings has focused on adults, a few studies[11–15] have examined exposure to warnings among youth. A 1996 survey[13] of California adolescents showed that about two thirds of the total sample, and 83% of regular smokers, reported ever reading a warning label on a package of cigarettes. However, responses to follow-up questions revealed that fewer participants could identify specific statements: Across warning statements, the proportion of the sample able to correctly recognize the statement ranged from 21% to 53%, with greater recognition among regular smokers.

A 2005 U.K. study[12] found that approximately half of youth surveyed (51%) reported seeing (at that time, text-based) warnings on cigarette packs often or very often. Research on SLT warning labels is even more limited[16] and no studies, to our knowledge, have examined exposure to SLT warning labels among adolescents. In sum, the data on the prevalence of adolescent exposure to tobacco warning labels are limited and outdated, and in the case of SLT, nonexistent.

Warning labels have the potential to reach a wide audience.[8] Although they are most frequently visible to those who come in direct contact with the product, warning labels are potentially viewed any time products are taken out in public, and may be visible behind the counter in retail outlets.[8,17] However, as noted previously, the current text-based warnings appear on the side of the cigarette pack, and in a font that is difficult to see from a distance. Moreover, given that current U.S. cigarette warning labels have not changed since 1985 and both cigarette and SLT warnings remain text-only, it is of interest whether these warnings are even noticed by adolescents.

The purpose of this study is to examine exposure to the tobacco product warning labels via self-reported frequency of seeing warnings among U.S. middle and high school students using data from the 2012 National Youth Tobacco Survey (NYTS). This survey included items about exposure to warning labels on two product types: cigarettes and SLT. Although tobacco warnings also appear in print advertisements, warning exposure is typically measured in the context of product warning labels. Because of the potential for warning labels to educate both current and potential users, warning label exposure among both current users and non-current users of each product is examined.

Second, this paper explores what happens when labels are reportedly seen—namely, the extent to which seeing warnings makes youth think about the health risks of tobacco use. Finally, the study examines the relationship between warnings and perceived harm of tobacco use. Based on previous research showing that warnings that elicit greater responses (e.g., thoughts or feelings) are more effective, this study examines whether the extent to which warnings lead to thoughts about health risks is associated with greater perceived harm of tobacco use.

Methods

The NYTS is an ongoing, school-based survey focusing on tobacco-related measures. NYTS uses a stratified three-stage cluster sample design to produce cross-sectional, nationally representative estimates of U.S. middle (Grades 6–8) and high school (Grades 9–12) students. The sampling frame includes middle and high schools in the 50 states and District of Columbia.

Participants complete a self-administered paper questionnaire in the classroom. Participation is voluntary at the school and student levels and anonymous at the student level. Parental permission is obtained for students. The CDC Human Research Protection Office approved the NYTS data collection protocol. Of the 228 (80.3%) sampled schools participating in 2012, surveys were completed by 24,658 students (91.7% of those eligible), yielding a participation rate of 73.6%. The eligible sample sizes for this study, after excluding students who did not respond to the cigarette and SLT warning label items, were 23,976, and 23,817, respectively.

Measures

Current use of cigarettes and SLT was measured with parallel items: *During the past 30 days, on how many days did you smoke cigarettes (use chewing tobacco, snuff, or dip)?* Individuals who selected *0 days* were labeled "non-users," which included both former and never users. All others were categorized as "current users." This approach enabled a comparison between current use (as a route of exposure) and non-current use. Because of the potential impact of product use frequency on exposure to warning labels, current users were categorized into two types of users: "frequent users" (individuals who selected *20 to 29 days* or *all 30 days*) and "non-frequent users" (the remaining users).

Exposure to warning labels was assessed with one item per product type: *A warning label tells you if a product is harmful to you and can either be a picture or words. During the past 30 days, how often did you see a warning label on a cigarette pack (an SLT product, such as chewing tobacco, snuff, dip or snus)?* Participants

Table 1. Prevalence of exposure to cigarette pack and smokeless tobacco in past 30 days, 2012 National Youth Tobacco Survey, % (95% CI)

Characteristics	Cigarette pack (*n*=23,967)	Smokeless tobacco (*n*=23,817)
OVERALL	34.1 (32.6, 35.7)	20.6 (19.1, 22.2)
Sex		
Male	36.1 (34.6, 37.7)	24.4 (22.6, 26.3)
Female	32.0 (30.2, 33.9)	16.8 (15.3, 18.4)
Race/ethnicity		
White, non-Hispanic	34.0 (31.7, 36.3)	20.9 (18.9, 23.1)
Black, non-Hispanic	33.9 (30.9, 36.9)	18.5 (16.5, 20.7)
Asian, non-Hispanic	24.8 (20.7, 29.3)	12.5 (10.2, 15.2)
Other, non-Hispanic	39.0 (36.2, 42.0)	22.2 (19.8, 24.7)
Hispanic	34.6 (32.4, 36.8)	21.8 (19.8, 23.9)
School level		
Middle school	31.8 (29.9, 33.8)	18.2 (16.7, 19.8)
High school	35.9 (33.9, 37.9)	22.4 (20.6, 24.4)
Current cigarette smoker[a]		
Yes	89.9 (88.1, 91.5)	—
No	27.9 (26.7, 29.2)	—
Current smokeless tobacco user[a]		
Yes	—	87.5 (84.6, 89.9)
No	—	17.3 (16.2, 18.6)

[a]Reported smoking cigarettes (using smokeless tobacco) on at least 1 day within the past 30 days

responded using the following 5-point response scale: *never, rarely, sometimes, most of the time, always, or I did not see a cigarette pack (SLT product) during the past 30 days.* First, participants were categorized into two groups: those who indicated they had not seen a cigarette pack or SLT product (*did not see*) were labeled the "not exposed" group; the remaining were the "exposed" group. Among the exposed group, frequency of exposure to cigarette and SLT warning labels was categorized as either "high exposure" to warnings (*most of the time* and *always*) or "not high exposure" to warnings (*never* to *sometimes*).

The degree to which seeing a warning label elicited a response was assessed with the item: *During the past 30 days, to what extent did warning labels on cigarette packs (SLT product) make you think about the health risks of smoking (using SLT, such as chewing tobacco, snuff, dip, or snus)?* Participants responded using a 4-point scale from *not at all to a lot, or I did not see a warning label on a cigarette pack (SLT product) in the past 30 days.* Respondents were classified into two groups: those that reported the warnings made them think about health risks "a lot" versus the remaining responses (excluding *I did not see a warning label*), which were coded as "not a lot."

Perception of harm for each product type was measured with the item: *How much do you think people harm themselves when they smoke cigarettes (use SLT, such as chewing tobacco, snuff, dip, or snus) some days but not every day?* on a 4-point scale ranging from *no harm* to *a lot of harm.* Responses were dichotomized such that the top response (*a lot of harm*) was categorized as "very harmful" and the remaining responses as "not very harmful." The *some days but not every day* harm perception item was chosen over the frequent-use *every day* version of this item to assess perceived harm of intermittent use; responses were more equally distributed in the former, whereas to the latter the majority responded *a lot of harm.*

Data Analysis

All analyses were conducted using SAS-callable SUDAAN, version 11 (RTI International, Research Triangle Park NC) in 2013. Final weights were applied to reflect initial selection probabilities, non-response adjustment, weight trimming, and post-stratification to national student population estimates. Missing values of the study measures were excluded and not presented as a separate stratum. The proportion of missing data for the study measures was no more than 5%, thus a missing data analysis was not conducted.

Prevalence estimates and 95% CIs of exposure to cigarette packs and SLT products, exposure to cigarette and SLT warning labels, and warning label responses are presented for the overall sample and stratified by sex, race/ethnicity, grade, current user status, and product use frequency. All prevalence estimates were weighted to represent the national youth population.

For analysis of warning label exposure, respondents who reported they did not see a cigarette pack or SLT product were excluded from analysis because they did not have an opportunity to see the warning labels. Thus, frequency of exposure (high or low) to warning labels was only calculated for participants who presumably had the opportunity to view a warning label. Similarly, those who reported they did not see a warning label were excluded from the analysis of responses to warning labels. Multivariable logistic regression models were conducted on dichotomized harm perception of cigarette and SLT products separately to examine the relationships between thinking about health risks in response to the relevant warning label and harm perception, controlling for sex, race, school level, and current product use.

Results

Overall, a minority of students indicated they had been exposed to a cigarette pack (34.1%) or SLT (20.6%) in the

Table 2. Prevalence of high exposure to cigarette and smokeless tobacco warning labels, 2012 National Youth Tobacco Survey, % (95% CI)

Characteristics	Cigarette pack (*n*=8,087)	Smokeless tobacco (*n*=4,903)
OVERALL	46.9 (45.0, 48.8)	40.3 (37.7, 43.0)
sex		
Male	50.5 (48.0, 52.9)	44.8 (41.4, 48.3)
Female	42.8 (40.6, 45.0)	33.7 (30.7, 36.9)
Race/ethnicity		
White, non-Hispanic	53.9 (51.8, 55.9)	49.6 (46.5, 52.6)
Black, non-Hispanic	38.2 (34.1, 42.6)	24.5 (20.1, 29.5)
Asian, non-Hispanic	44.8 (38.1, 51.6)	29.6 (20.9, 40.1)
Other, non-Hispanic	44.0 (39.6, 48.6)	37.8 (32.5, 43.4)
Hispanic	37.5 (34.6, 40.4)	29.0 (25.5, 32.7)
School level		
Middle school	35.6 (33.1, 38.2)	32.3 (29.4, 35.4)
High school	54.7 (52.4, 56.9)	45.5 (42.2, 48.8)
Current cigarette smoker[a]		
Yes	62.6 (59.9, 65.3)	—
No	42.1 (39.8, 44.5)	—
Cigarette smoking frequency[b]		
Frequent	74.5 (69.9, 78.5)	—
Non-frequent	56.5 (53.4, 59.7)	—
Current smokeless tobacco user[a]		
Yes	—	66.6 (62.4, 70.6)
No	—	34.7 (32.3, 37.1)
Smokeless tobacco frequency[b]		
Frequent	—	79.2 (74.0, 83.5)
Non-frequent	—	60.2 (55.1, 65.1)

Note: High exposure was defined as those who reported *most of the time* or *always* to the question *During the past 30 days how often did you see a warning label on a cigarette pack (smokeless tobacco product)?*
[a]Reported smoking cigarettes (using smokeless tobacco) on at least 1 day within the past 30 days
[b]Reported smoking cigarettes (using smokeless tobacco) 20 or more times in the past 30 days

past 30 days (Table 1). Reports of seeing a cigarette pack or SLT product were highest among product users (89.9% and 87.5%, respectively). Among those who had seen a pack or SLT product, reported exposure to warnings labels was limited, with some variation across demographic and tobacco user characteristics (Table 2). Current smokers were more likely to report high exposure (62.6%) compared to non-smokers (42.1%), with frequent smokers most likely to report high exposure to cigarette warning labels (74.5%).

Compared to exposure to cigarette warning labels, rates of exposure to SLT warning labels were lower, with similar patterns across groups (Table 2). Once again, current users were more likely to report high exposure to warnings (66.6%), with those reporting frequent use most likely to report high exposure (79.2%).

Among those who had seen a warning label, a minority of students indicated that seeing warning labels on a cigarette pack (30.4%) or SLT (25.2%) elicited thoughts about health risks "a lot" (Table 3). Among current smokers, a divergence between reports of warning exposure and response to warnings was observed: Whereas they reported the greatest exposure to warnings, they were less likely to report thinking "a lot" about the health risks in response to seeing a warning label. Indeed, only 13.8% of current smokers, compared to 35.9% of nonsmokers, reported that warnings made them think "a lot" about health risks. Response to warning labels did not significantly differ by smoking frequency.

The results for SLT warnings mirror the patterns of those for cigarette warnings in terms of school level and user status, with middle school students and nonusers reporting greater prevalence of reporting that warnings elicited thoughts about health risks "a lot."

Finally, the relationship between the extent to which warnings led to thoughts about health risks and perceptions of the harmfulness of tobacco use was examined using multivariable logistic regression. Because reports of responses to warning labels differed by user status (Table 3), the initial models were run including the interaction terms (current use × thinking about health risks). In both models, the interaction term was not significant ($p > 0.6$); thus, results are presented from models run without the interaction term (Table 4).

Perceiving greater harmfulness of using cigarettes was more likely among female and high school

Table 3. Prevalence of thinking about health risks "a lot" in response to warning labels, 2012 National Youth Tobacco Survey, % (95% CI)

Characteristics	Cigarette pack (n=6,899)	Smokeless tobacco(n=4,703)
OVERALL	30.4 (28.9, 31.9)	25.2 (23.7, 26.8)
Sex		
Male	29.7 (27.8, 31.7)	24.4 (22.3, 26.7)
Female	31.2 (29.1, 33.4)	26.5 (24.0, 29.2)
Race/ethnicity		
White, non-Hispanic	29.3 (27.2, 31.6)	25.4 (23.4, 27.5)
Black, non-Hispanic	36.1 (32.3, 40.0)	24.7 (20.1, 29.9)
Asian, non-Hispanic	30.9 (24.7, 37.9)	27.5 (20.5, 35.9)
Other, non-Hispanic	30.7 (25.8, 36.1)	24.5 (20.5, 29.0)
Hispanic	29.5 (27.1, 32.0)	25.2 (21.8, 28.8)
School level		
Middle school	36.7 (34.4, 39.1)	31.3 (28.6, 34.2)
High school	26.7 (24.9, 28.5)	21.6 (19.8, 23.5)
Current cigarette smoker[a]		
Yes	13.8 (12.4, 15.4)	—
No	36.9 (35.1, 38.8)	—
Cigarette smoking frequency[b]		
Frequent	13.5 (10.9, 16.8)	—
Non-frequent	14.0 (12.0, 16.2)	—
Current smokeless tobacco user[a]		
Yes	—	13.4 (10.8, 16.5)
No	—	28.0 (26.2, 30.0)
Smokeless tobacco frequency[b]		
Frequent	—	12.3 (8.4, 17.7)
Non-frequent	—	14.0 (11.0, 17.6)

Note: Thinking about health risks "a lot" in response to warning labels was defined as those who reported *a lot* to the question *During the past 30 days to what extent did warning labels make you think about the health risks of cigarettes (smokeless tobacco products)?*
[a]Reported smoking cigarettes (using smokeless tobacco) on at least 1 day within the past 30 days
[b]Reported smoking cigarettes (using smokeless tobacco) 20 or more times in the past 30 days

students; current smokers were less likely to perceive cigarettes as very harmful, compared to non-current smokers.

Thinking about health risks "a lot" in response to warnings was positively associated with greater perceptions of harm: those who reported they thought "a lot" about health risks after seeing cigarette warnings were about 60% more likely to agree that cigarette smoking causes a lot of harm, compared to those for whom the warnings did not make them think about health risks "a lot."

For SLT products, students who were female, Black, Asian, or Hispanic were more likely to report greater harmfulness from product use; current SLT users were less likely to perceive greater harm from product use compared to those who did not currently use SLT. Those who reported that SLT warning labels elicited thoughts about health risks "a lot" were also more likely to perceive SLT use as very harmful.

Discussion

In order to be optimally effective, warning labels must first be noticed and, once noticed, elicit some response from the perceiver. Current data show that among youth who had seen a cigarette pack or SLT package, less than half reported seeing a warning label "most of the time" or "always." However, as might be expected given their increased contact with the product, nearly two thirds of current product users reported high exposure to warnings.

Importantly, however, when warning labels were noticed, they did not elicit strong responses in terms of thoughts about health risks, and this was especially true among current users. This finding is consistent with recent data from a survey of U.S. adults, which concluded that the current warning labels on cigarettes have little impact on current and former smokers.[18]

Cigarette warning labels in the U.S. have not changed for almost three decades, and despite SLT warning updates in 2010, neither warning label currently incorporates images or other features shown empirically to be associated with enhanced salience.[2] In addition, based on the marketing, communications, and psychology literatures regarding habituation and wear-out, the current findings are not surprising.[19–21]

As noted previously, thinking about health risks in response to warnings was especially low among current tobacco users. Some research[22,23] suggests that tobacco warnings may create cognitive dissonance for users, and

Table 4. Multivariable logistic regression predicting greater perceived harm of tobacco use, 2012 National Youth Tobacco Survey, OR (95% CI)

Characteristics	Cigarette pack (n=6,342)	Smokeless tobacco (n=4,361)
sex		
Male	ref	ref
Female	**1.4 (1.2, 1.6)**	**1.3 (1.2, 1.6)**
Race/ethnicity		
White, non-Hispanic	ref	ref
Black, non-Hispanic	1.0 (0.8, 1.2)	**1.6 (1.2, 2.2)**
Asian, non-Hispanic	1.0 (0.8, 1.4)	**1.7 (1.1, 2.6)**
Other, non-Hispanic	1.2 (1.0, 1.5)	1.4 (1.0, 2.0)
Hispanic	1.0 (0.9, 1.3)	**1.4 (1.1, 1.8)**
School level		
Middle school	ref	ref
High school	**1.2 (1.1, 1.4)**	1.2 (0.9, 1.5)
Thinking about health risks in response to warning labels		
Not a lot	ref	ref
A lot	**1.6 (1.4, 2.0)**	**1.8 (1.5, 2.1)**
Current cigarette smoker[a]		
Yes	**0.4 (0.3, 0.5)**	—
No	ref	—
Current smokeless tobacco user[a]		
Yes	—	**0.3 (0.3, 0.4)**
No	ref	ref

Note: Boldface indicates statistical significance ($p<0.05$). Greater perceived harm was defined as those who reported *a lot of harm* to the question *How much do you think people harm themselves when they smoke cigarettes (use smokeless tobacco) some days but not every day?*
[a]Reported smoking cigarettes (using smokeless tobacco) on at least 1 day within the past 30 days

even trigger defensive processes such as reactance. This suggests a potential limitation of warning labels—particularly for those who already use the product. Taken together, these data reaffirm that warning labels cannot constitute a stand-alone tobacco control strategy, but rather are only one of several means of educating youth about the harm of tobacco use.

Limitations

Several limitations of the current study are worth mentioning. First, there are limitations inherent to self-report measures.[24–25] In the current study, youth self-reported their frequency of warning exposure. Responses to these items likely reflect the individuals' subjective impression of their exposure to warnings—an impression, which in turn is likely influenced by many factors, including attitudes about warnings and tobacco use.[24] The degree to which these self-reports correspond to the actual frequency with which adolescents were exposed to warning labels cannot be determined. However, to the extent that the goal is to assess what, if any, lasting impression warnings make on youth, these self-reports are nonetheless meaningful.

A second limitation arises from the cross-sectional nature of the study. The expected relationship between subjective response to warnings (thinking about health risks) and perceptions of the harmfulness of tobacco use was observed. Theory and previous research[9,10] suggest this relationship might be causal; that is, exposure to warnings changes perceptions accordingly. However, because this is a cross-sectional survey, one cannot infer a causal or directional relationship. For instance, it is equally plausible that individuals who hold negative attitudes about tobacco use are in turn more likely to attend to and remember warnings, and likewise report that warnings have affected them.

Indeed, people tend to selectively notice and remember information that is consistent with what they already know and believe, and discount or disregard information that is inconsistent with their beliefs.[26–28] These biases may also partially explain why strong responses to warnings were markedly less prevalent among current users compared to non-users. Because these biases are unavoidable in survey research—which relies on respondent retrospection—it is imperative to complement surveillance efforts with experimental methods to fully understand the mechanisms underlying the effects of tobacco warning labels.

Finally, based on the items available on the NYTS, this study was limited to assessing exposure to warning labels on only two product types, to the

exclusion of others—including those products becoming increasingly prevalent (e.g., cigar products).[29] It will be important for future research to examine exposure to, and the impact of, warning labels on tobacco products other than conventional cigarettes and SLT.

Conclusions

The present research suggests that when the current warnings are noticed by youth, they are not likely to elicit thoughts about the health risks of tobacco use, particularly among current tobacco users. These findings suggest that there is room for improvement in warning labels, particularly in the degree to which they engage the perceiver, in order for them to be optimally effective in informing current and potential tobacco users about the health risks of tobacco use.

Publication of this article was supported by the U.S. Food and Drug Administration, Center for Tobacco Products.

The authors acknowledge Sue Curry and members of the U.S. Food and Drug Administration's (FDA's) Center for Tobacco Products who provided critical input and assistance with preparing this manuscript: Catherine Corey, Benjamin Apelberg, Cathy Backinger, and Deborah Neveleff.

Disclaimer: The information in this article is not a formal dissemination of information by the FDA and does not represent agency position or policy. The contents are the responsibility of the authors alone. Charles C. Wu completed all work on this project and paper while working at the Center for Tobacco Products, Food and Drug Administration.

No financial disclosures were reported by the authors of this paper.

References

1. CDC. Current tobacco use among middle and high school students—U.S., 2011–2012. MMWR Morb Mortal Wkly Rep 2013;62(45):893–7.
2. Hammond D. Health warning messages on tobacco products: a review. Tob Control 2011;20(5):327–37.
3. Hammond D, Fong GT, McNeill A, Borland R, Cummings KM. Effectiveness of cigarette warning labels in informing smokers about the risks of smoking: findings from the International Tobacco Control (ITC) Four Country Survey. Tob Control 2006;15(3S): Siii19–Siii25.
4. Hammond D, Fong GT, McDonald PW, Brown KS, Cameron R. Graphic Canadian cigarette warning labels and adverse outcomes: evidence from Canadian smokers. Am J Public Health 2004;94(8):1442–5.
5. USDHHS. Preventing tobacco use among youth and young adults: a report of the Surgeon General. USDHHS, CDC, Office on Smoking and Health, 2012.
6. Substance Abuse and Mental Health Services Administration. Results from the 2010 National Survey on Drug Use and Health: Summary of National Findings, September 2011. samhsa.gov/data/NSDUH/2k10NSDUH/2k10Results.htm.
7. WHO Framework Convention on Tobacco Control. Elaboration of guidelines for implementation of Article 11 of the Convention. August 21, 2008. Durban: WHO, 2008. apps.who.int/gb/fctc/PDF/cop3/FCTC_COP3_7-en.pdf.
8. Hammond D. Tobacco packaging and labeling policies under the U.S. Tobacco Control Act: research needs and priorities. Nicotine Tob Res 2012;14(1):62–74.
9. Strahan EJ, White K, Fong GT, Fabrigar LR, Zanna MP, Cameron R. Enhancing the effectiveness of tobacco package warning labels: a social psychological perspective. Tob Control 2002;11(3):183–90.
10. Borland R, Yong HH, Wilson N, et al. How reaction to cigarette packet health warnings influence quitting: findings from the ITC Four-Country survey. Addiction 2009;104(4):669–75.
11. White V, Webster B, Wakefield M. Do graphic health warning labels have an impact on adolescents' smoking-related beliefs and behaviors? Addiction 2008;103(9):1562–71.
12. Moodie C, MacKintosh AM, Hammond D. Adolescents' response to text-only tobacco health warnings: results from the 2008 UK Youth Tobacco Policy Survey. Eur J Public Health 2010;20(4):463–9.
13. Robinson TN, Killen JD. Do cigarette warning labels reduce smoking? Paradoxical effects among adolescents. Arch Pediatr Adolesc Med 1997;151(3):267–72.
14. Moodie C, Mackintosh AM, Hastings G. Adolescents' response to pictorial warnings on the reverse panel of cigarette packs: a repeat cross-sectional study. Tob Control 2013: In press.
15. Wardle H, Pickup D, Lee L, et al. Evaluating the impact of picture health warnings on cigarette packets. London: Public Health Research Consortium, 2010.
16. Callery WE, Hammond D, O'Connor RJ, Fong GT. The appeal of smokeless tobacco products among young Canadian smokers: the impact of pictorial health warnings and relative risk messages. Nicotine Tob Res 2011;13(5):373–83.
17. Dewhirst T. POP goes the power wall? Taking aim at tobacco promotional strategies utilised at retail. Tob Control 2004;13(3):209–10.
18. O'Hegarty M, Pederson LL, Nelson DE, Mowery P, Gable JM, Wortley P. Reactions of young adult smokers to warning labels on cigarette packages. Am J Prev Med 2006;30(6):467–73.
19. Thompson RF, Spencer WA. Habituation: a model phenomenon for the study of neuronal substrates of behavior. Psychol Rev 1966;73(1):16–43.
20. Blair MH. An empirical investigation of advertising wearin and wearout. J Advert Res 2000;40(6):95–100.
21. Scott DR, Solomon D. What is wearout anyway? J Advert Res 1998;38(5):19–28.
22. Erceg-Hurn DM, Steed LG. Does exposure to cigarette health warnings elicit psychological reactance in smokers? J App Soc Psych 2011;41(1):219–37.
23. Stewart DW, Martin IM. Intended and unintended consequences of warning messages: a review and synthesis of empirical research. J Public Policy Mark 1994;13(1):1–19.
24. Nisbett RE, Wilson TD. Telling more than we can know: verbal reports on mental processes. Psychol Rev 1977;84(3):231–59.
25. Schwarz N, Oyserman D. Asking questions about behavior: cognition, communication, and questionnaire construction. Am J Eval 2001;22(2):127–60.
26. Kunda Z. The case for motivated reasoning. Psychol Bull 1990;108(3):480–98.
27. Holbrook A, Berent MK, Krosnick JA, Visser PS, Boninger DS. Attitude importance and the accumulation of attitude relevant knowledge in memory. J Pers Soc Psychol 2005;88(5):749–69.
28. Ditto PH, Lopez DF. Motivated skepticism: use of differential decision criteria for preferred and nonpreferred conclusions. J Pers Soc Psychol 1992;63(4):568–84.
29. Corey CG, Dube SR, Ambrose BK, King BA, Apelberg BJ, Husten CG. Cigar smoking among U.S. students: reported use after adding brand examples to survey items. Am J Prev Med 2014;47(2S1):S28–S35.